



# Saving Energy

## Michigan's State Facilities

### Caro Regional Mental Health Center

*Net excess savings yield \$179,471 in first three years*

#### **Mental Health Center Uses Energy Cost Savings to Pay for Energy Improvements**

With an energy savings performance contract, the Caro Regional Mental Health Center made energy efficiency building improvements that are guaranteed to yield almost \$1 million in avoided natural gas and power expenses during the first 5 years.

In 1994, Caro entered into a performance contract with Noresco, an energy service company (ESCO), to install energy efficiency improvements and reduce energy costs. By limiting the contract to measures with short paybacks, Caro was able to limit the length of the contract to 5 years. The measures which were installed at the 523,330 square foot, 38 building facility included:

- elimination of high pressure steam distribution
- summer shutdown of the central power plant
- computerized building management system
- lighting upgrades

#### **Elimination of High Pressure Steam Distribution Lines**

The existing steam boilers had originally supplied a 125 psi steam line feeding high pressure steam equipment located throughout the campus, including kitchen equipment, a laundry ironer, and an autoclave. By installing stand-alone equipment, a separate steam boiler for the laundry, and individual steam boilers for two campus buildings, over 1/4 mile of high pressure steam distribution line was removed.

By also installing eight individual hot water heaters in various locations throughout Caro, the steam-to-hot water converter for domestic hot water was no longer required, and the central power plant was able to be shut down during summer months. Natural gas savings from these two measures is estimated to be \$71,755 per year.

#### **Building Management System**

To increase natural gas savings, an automated building management system was installed. The new building automation system consists of a system of self-contained, digital controllers which allow Caro's maintenance personnel to monitor the operation of the facility and to maximize energy savings.

Prior to the installation of the automated system, all temperature controls were manual. The new system allows the automatic control of fan operation and regulation of heat during unoccupied periods. Temperatures in buildings not occupied at night are reduced to 55°F. With the automated system, a morning warm-up period heats the building from its night setback temperature just prior to occupancy. The new system allows:

- optimum start and shut-off of HVAC equipment
- better time-scheduling during occupied hours
- electrical demand shedding
- closing of outside air dampers during unoccupied periods

#### **Improved Lighting**

Lighting upgrades performed at the various Caro buildings consisted of replacing present 34-watt T12 lamps and magnetic ballasts with energy efficient T8 lamps and power reducing electronic ballasts.

High wattage incandescent lamps were replaced with either new 1'x4' T8 fixtures, compact fluorescents or new high pressure sodium (HPS) fixtures. In the bus garage, 22 high output 1'x8' fluorescent fixtures were replaced with 16 100-watt HPS fixtures. The total cost of the lighting upgrade was \$127,131. At a savings of \$35,527 per year in electricity costs, the upgrade will pay for itself in 3.6 years.

### **Maintenance Services & Training**

As in most performance-based energy efficiency contracts, Noresco provides follow-up maintenance services to keep Caro's upgraded system running at peak efficiency and to assure the success of the savings program. Noresco will continue to track actual energy expenses and compare to guaranteed savings during the remainder of the 5-year contract.

### **Guaranteed Savings**

As in all energy savings performance contracts, Noresco assumes the performance risk, that the installed measures will achieve the expected savings benefit. Energy and operating savings guaranteed by Noresco are then used to pay off the contract. In the case of a savings shortfall during the term of the contract, Noresco has agreed to pay the difference. In the event of a savings shortfall in any quarter, however, credit will first be given to Noresco for accumulated savings in excess of the State's contract payments which were aggregated over prior quarters.

### **Utility Costs Reduced by \$769,424 in first 3 years**

Implementation of the energy improvement measures was expected to save \$196,651 annually, reducing utility operating costs by 25%.

Caro far exceeded the energy savings goals set for the facility by Noresco. Using a computer model of the Caro facility, Noresco had originally projected guaranteed savings of \$589,953 per year for the first two years.

During that 3-year period, Caro achieved excess savings of \$179,471 over and above the projected savings. Actual utility operating costs were reduced by 45% — an additional 20% over the savings that Noresco had guaranteed.

To make performance contracting an attractive financing option for state facilities, the Department of Management & Budget (DMB) and EO have streamlined the procurement process. DMB and EO also assemble a technical support team to assist the contracting agency. Standardized legal documents are used, and a review process assists the approval of performance contract proposals.

### **Performance Contracting**

An energy performance contract is an agreement between a state agency and an ESCO to improve the energy efficiency of a facility. Through the agreement, an ESCO provides a variety of services, including a detailed engineering study; design, financing & installation for energy conservation measures; maintenance on installed measures; troubleshooting and monitoring energy savings.

### **PA 122 Certification**

Excess or net cost savings from the improvement project were verified by Noresco by tracking actual energy expenses. Under Michigan's Public Act (PA) 122 of 1987, state facilities are able to retain 75% of their annual energy cost avoidance for future projects. In FY 96-97, the Energy Office (EO) certified \$31,729 in net cost savings from the Caro/Noresco project, which Caro is applying to on-going energy-savings projects.

*Feel free to contact us if you have any ideas for case studies or other questions :*

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